Patent
Docket No.: 56433US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Albert E. Seaver and William K. Leonard		
Serial No.:	09/841,380	Group Art Unit: 1734
Confirmation No.:	5859	Examiner: George R. Koch
Filed:	April 24, 2001	
For:	ELECTROSTATIC SPRAY COATING APPARATUS AND METHOD	

Certificate of Express Mailing	
Pursuant to 37 CFR 1.10, I certify that three copies of this Brief on Appeal are being deposited on the date indicated below with the United States Postal Service "Express Mail Post Office to Addressee" service addressed to: Mail Stop Appeal Brief – Patents, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.	
Express Mail Mailing Label No. ER 523730443 US	Signature of Person Mailing Application Lynelle K. Grube
Date of Deposit April 19, 2004	Printed Name of Person Mailing Application Lynelle K. Grube

BRIEF ON APPEAL

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This is an appeal from the Final Rejection mailed December 16, 2003 rejecting claims 33 – 59. The Notice of Appeal was filed by mail on February 17, 2004 and received in the USPTO on February 19, 2004. The due date for this Brief is April 19, 2004.

This Brief is being filed in triplicate. The fee required under 37 CFR §1.17(c) for the appeal should be charged to Deposit Account No. 13-3723.

04/22/2004 MAHMED1 00000104 133723 09841380
01 FC:1402 330.00 DA

PTO/SB/17 (10-03)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 330.0

Complete if Known	
Application Number	09/841,380
Filing Date	April 24, 2001
First Named Inventor	Albert E. Seaver
Examiner Name	George R. Koch
Art Unit	1734
Attorney Docket No.	56433US002

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 13-3723

Deposit Account Name: 3M Innovative Properties Co.

The Director is authorized to: *(check all that apply)*

☑ Charge fee(s) indicated below ☑ Credit any overpayments

☑ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X	=
Independent Claims		- 3** =		X	=
Multiple Dependent					=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	330
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 330.00

SUBMITTED BY				(Complete *(if applicable)*)	
Name (Print/Type)	David R. Cleveland	*Registration No. (Attorney/Agent)*	29,524	*Telephone*	612-331-7412
Signature				*Date*	April 19, 2004

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest is 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

Appellant, Appellant's legal representative and the assignee are not aware of any appeals or interference proceedings before the U.S. Patent and Trademark Office that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

Fifty nine claims were filed with the application. Claims 1 – 32 were drawn to a method for forming a liquid coating on a substrate and claims 33 – 59 were drawn to a coating apparatus. The claims were subjected to a telephonic two-way restriction requirement on August 1, 2002. On August 27, 2002 (in Paper No. 6) the restriction requirement was confirmed and claims 33 – 59 were rejected. On November 27, 2002 Appellants confirmed their election of claims 33 – 59 and amended claims 1, 33, 38 – 41, 44, 50 – 52 and 54 – 57. On February 19, 2003 (in Paper No. 11) the Examiner withdrew claims 1 – 32 and finally rejected claims 33 – 59. On May 18, 2003 Appellants filed a Request for Continued Examination and amended claims 33, 34 38 and 39 via a Preliminary Amendment. On June 19, 2003 (in Paper No. 15) the Examiner rejected claims 33 – 59. Appellants filed a Response on September 18, 2003 but did not further amend the claims. On December 16, 2003 the Examiner again finally rejected claims 33 – 59.

No claims are allowed. Claims 33 – 59 are pending in this appeal. Claim 33 is an independent claim and claims 34 – 59 are dependent claims. A copy of the appealed claims is reproduced in the Appendix, with the amended claims being identified as "Amended" and the unamended claims being identified as "Original".

STATUS OF AMENDMENTS

All amendments (viz., those filed on November 22, 2002 and May 19, 2003) have been entered. The claims in the Appendix incorporate all amendments made by Appellants.

SUMMARY OF THE INVENTION

Drop spreading times and coating leveling times can be significant rate-limiting factors for coating processes that involve the delivery of drops to a substrate (see e.g., page 2, line 2 through page 3, line 13). Substrate charge buildup can also pose a problem, especially when electrostatically coating nonconductive substrates (see e.g., page 3, lines 14 – 32). It can also be difficult to use electrostatic coating to form a coating on only one side of a porous substrate (see e.g., page 4, lines 1 – 6).

Appellants' invention provides an electrostatic coating apparatus having a liquid coating composition (e.g., liquid **13** in **Fig. 1**), an electrostatic spray head (e.g., spray head **11**), and a circulating conductive transfer surface (e.g., drum **14**) that when wet with the liquid coating composition can transfer a portion of the liquid coating composition to a substrate (e.g., moving web **16**). One form of the apparatus (having an optional grounded conductive transfer surface) is shown in **Fig. 1**, reproduced below:

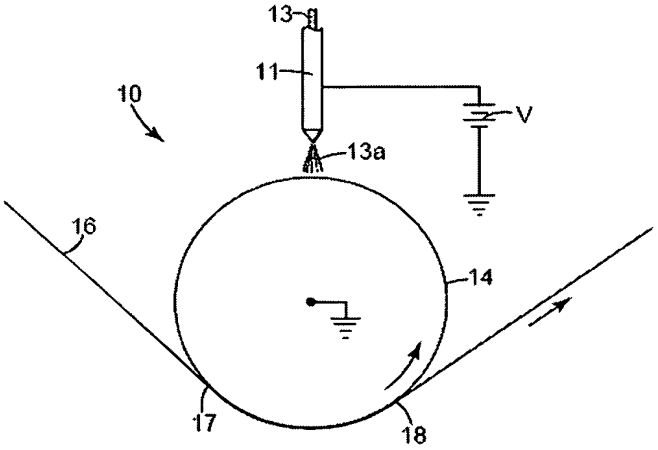


Fig. 1

The electrostatic spray head applies drops of the liquid coating composition onto a target region of the conductive transfer surface. Following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region has a continuous coating of the liquid coating composition. This greatly facilitates wetting and spreading of the liquid coating composition when newly applied drops land on the target region. In the words of the Written Description:

> *"The wet surface on drum **14** assists newly applied drops of liquid **13** in spreading and coalescing prior to contact with web **16**. Drop spreading issues are further reduced due to the pressure exerted by web **16** on drum **14**. The drops coalesce and the coating becomes continuous in a much shorter time than is the case when atomized drops are sprayed directly onto a substrate and spread at a rate based on the drop's own physical properties. This is especially helpful for thin coatings, where the drops tend to be widely separated. Web charging issues are overcome because the charged drops are neutralized when they contact the drum, and before they are transferred to the moving web."* (Page 7, lines 24 – 32).

The claimed apparatus enables application of substantially uniform thin film or thick film coatings, on conductive, semi-conductive, insulative, porous or non-porous substrates. When the apparatus includes a grounded conductive transfer surface (e.g., as shown in **Fig. 1**), the apparatus facilitates coating of semi-conductive, insulative or porous substrates without requiring placement of a pre-charge or net charge on the web, and without requiring web neutralization (see e.g., Example 1 at page 28, lines 4 – 25; Comparison Example 4 at page 38 and Example 8 at pages 38 – 39).

When the apparatus includes a nip roll that forces the substrate against the conductive transfer surface, the nip roll helps to spread and coalesce the drops on the conductive transfer surface into a uniform, void-free coating more rapidly than when a nip roll is not employed (see e.g., Example 2 at pages 28 – 29, and nip roll **26** in **Fig. 3a**, reproduced below).

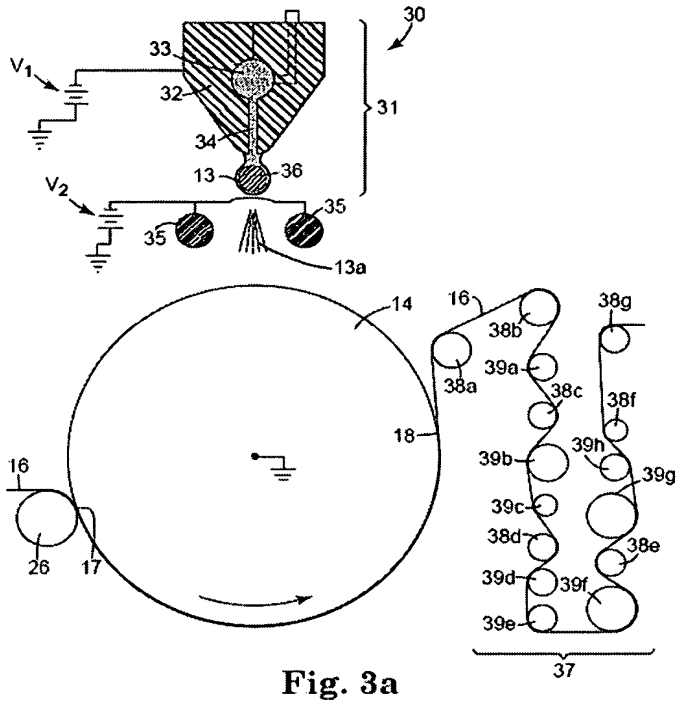


Fig. 3a

When the apparatus includes two or more pick-and-place devices that can periodically contact and re-contact the wet coating at different positions on the substrate, wherein the devices have periods that improve the uniformity of a coating on the substrate compared to a coating made without such devices, the apparatus can diminish input defects to such an extent that the defects are no longer objectionable (see e.g., page 16, line 9 through page 17, line 14, Example 3 at page 29 and improvement station **37** in **Fig. 3a**).

The apparatus can be used to prepare extremely thin, void-free coatings (see e.g., Table IV at page 37 and the discussion at page 37, line 20 through page 38, line 2).

The apparatus can also be used to apply a coating to one side of a porous substrate without causing substantial penetration of the coating through the substrate (see e.g., page 4, lines 1 – 6, page 12, lines 3 – 12, Example 8 at pages 38 – 39 and **Fig. 4b**).

The claimed apparatus is simple to construct, set up and operate, and can easily be adjusted to alter coating thickness and coating uniformity.

ISSUES ON APPEAL

The issues on appeal are as follows:

1. Was it proper to reject claims 33 – 35 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,503,325 B1 (Hess)?
2. Was it proper to reject claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 under 35 U.S.C. §103(a) as being unpatentable over Hess and U.S. Patent No. 4,847,110 (Nakajima et al.)?
3. Was it proper to reject claims 36, 42 and 53 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claims 33 – 35 above and further in view of Booth, *Evolution of Coating*?
4. Was it proper to reject claims 38 – 41 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of U.S. Patent No. 2,833,666 (Neidich)?
5. Was it proper to reject claims 44 – 50 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of U.K. Patent No. 1,278,099 (Hall)?

GROUPING OF CLAIMS

The claims do not stand or fall together. For purposes of expediting this appeal and complying with 37 CFR §1.192(c)(7), and without conceding that any of the claims grouped below should be similarly grouped in any subsequent appeal or patent infringement litigation concerning these claims, the claims could be considered by the Board according to the following groups:

I. Claims 33 – 35, 51, 52, 54, 56 and 57

II. Claims 36, 42 and 53

III. Claims 37 and 58

IV. Claims 38 – 41

V. Claim 43

VI. Claims 44 – 50

VII. Claim 55

VIII. Claim 59

Claim 33 of Group I recites a basic form of the claimed coating apparatus including a liquid coating composition, an electrostatic spray head and a circulating conductive transfer surface. Claims 34 and 35 recite particulars concerning the transfer surface direction of motion or construction and for purposes of this appeal can be considered with claim 33. Claims 51, 52, 54, 56 and 57 recite certain preferred substrates and for purposes of this appeal can also be considered with claim 33.

Claim 36 of Group II recites a preferred form of the apparatus wherein the transfer surface comprises a belt. Claim 36 is separately patentable over claim 33 because, *inter alia*, a belt may provide an extended region in which wetting and spreading of the applied coating may take place (see e.g., page 2, lines 7 – 14 and page 3, lines 6 – 11). Claims 42 and 53 recite embodiments having two or more transfer surfaces and for purposes of this appeal can be considered with claim 36.

Claim 37 of Group III recites an apparatus having a grounded conductive transfer surface. Claim 37 is separately patentable over claim 33 because, *inter alia*, application of the coating to a grounded conductive transfer surface prior to transfer to a substrate may facilitate coating of semi-conductive, insulative or porous substrates without requiring placement of a pre-charge or net charge on the web, and without requiring web neutralization (see e.g., page 8, lines 1 – 7, Example 1 at page 28, lines 4 – 25; Comparison Example 4 at page 38 and Example 8 at pages 38 – 39). Claim 58 also recites an apparatus having a grounded conductive transfer surface and for purposes of this appeal can be considered with claim 37.

Claim 38 of Group IV recites an apparatus having an electrostatic spray head that produces a line of charged droplets. Claim 38 is separately patentable over claim 33 because, *inter alia*, use of a line applicator in the claimed apparatus may provide especially uniform coating of wide substrates (see e.g., Example 7 at pages 36 – 38). Claims 39 – 41 recite embodiments that apply the coating composition in one or more lanes and for purposes of this appeal can be considered with claim 38.

Claim 43 of Group V recites an apparatus having one or more nip rolls that force the substrate against the conductive transfer surface. Claim 43 is separately patentable over claim 33 because, *inter alia*, a nip roll may help spread and coalesce the drops on the conductive transfer surface into a uniform, void-free coating, and decrease the time required for the drop coalescence (see e.g., page 4, lines 10 – 14, Example 2 at pages 28 – 29, and **Fig. 3a**).

Claim 44 of Group VI recites an apparatus having two or more pick-and-place devices that can periodically contact and re-contact the wet coating at different positions on the substrate, wherein the devices have periods that improve the uniformity of a coating on the substrate compared to a coating made without such devices. Claim 44 is separately patentable over claim 33 because, *inter alia*, a single pick-and-place device, or a train of devices having identical or reinforcing periods of contact, can be very detrimental. However, a random initial defect entering the apparatus or any defect generated by contact with the first pick-and-place device may be diminished by using more than two pick and place devices whose periods of contact are selected to reduce rather than repropagate the defect. Such an apparatus may provide improved coating uniformity rather than extended lengths of defective coating, and may diminish input defects to such an extent that the

defects are no longer objectionable (see e.g., page 16, line 9 through page 17, line 14, Example 3 at page 29 and **Fig. 3a**). Claims 45 – 50 recite preferred embodiments of such an apparatus and for purposes of this appeal can be considered with claim 44.

Claim 55 of Group VII recites an apparatus wherein the substrate is coated without substantial penetration of the coating through the substrate. Claim 55 is separately patentable over claim 33 because, *inter alia*, it normally is very difficult to apply a coating to one side of a porous substrate without causing substantial penetration of the coating through the substrate. The apparatus of claim 55 may enable doing so without such substantial penetration (see e.g., page 4, lines 1 – 6, page 12, lines 3 – 12, Example 8 at pages 38 – 39 and **Fig. 4b**).

Claim 59 of Group VIII recites an apparatus wherein the spray head produces drops having an average drop diameter, the transfer surface transfers a coating having an average caliper to the substrate, the average caliper is less than the average drop diameter, and the transferred coating is substantially void-free. Claim 59 is separately patentable over claim 33 because, *inter alia*, it is especially difficult to prepare coatings whose average caliper is less than the average drop diameter. The claim 59 apparatus may enable preparation of such coatings (see e.g., Table IV at page 37 and the discussion at page 37, line 20 through page 38, line 2).

ARGUMENTS OF APPELLANTS

Was it proper to reject claims 33 – 35 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,503,325 B1 (Hess)?

Claims 33 – 35 are in the above-mentioned Group I, and were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,503,325 B1 (Hess). The Final Rejection asserted that:

> *"Hess discloses an electrostatic spray head (Figure 3) that transmits a liquid coating. Hess also discloses that it is known to use transfer rollers as intermediaries in the transmission (column 6, lines 42-48). Such a transfer surface would be capable of being relatively conductive if used with an electrostatic spray head. Such a structure would be capable of transferring as claimed.*
>
> *"As to claim 34, such a transfer surface would circulate or rotate.*
>
> *"As to claim 35, the surface is called a roller, i.e., a drum."* (See page 2, numbered paragraph 2).

Hess does not show the apparatus of any of claims 33 – 35. This can be further appreciated by reading Hess in its entirety. Hess primarily involves a device for coating paper or cardboard (see e.g., col. 1, lines 19 – 20) with a powdery coating medium (see e.g., col. 2, lines 36 – 37). Hess employs a steam chamber or steam jet to cause condensation "on the coating medium particles while they travel from the spray device to the moving surface, thereby moistening them, so that after making contact with the moving surface they are able to flow and produce a smooth coating layer" (see col. 2, lines 38 – 43). Hess's cited **Fig. 3** embodiment employs a rotary spray nozzle **218** that can be electrostatically assisted (see e.g., col. 6, lines 10 – 18):

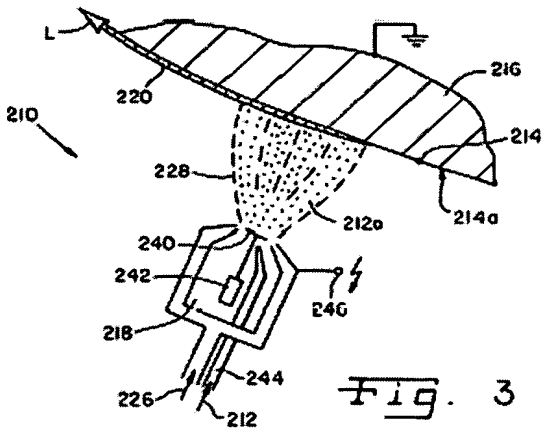


Fig. 3

The cited **Fig. 3** apparatus shows a clean web surface **214a** to which is applied a coating layer **220**. The **Fig. 3** target region does not have "a continuous coating of the liquid coating composition before newly applied drops land" as recited in rejected claims 33 – 35.

Hess's **Fig. 2** and **Fig. 4** embodiments employ a recommended steam blower **132** that "scrapes off" an air boundary layer on the incoming web **114** (the **Fig. 2** embodiment is shown below):

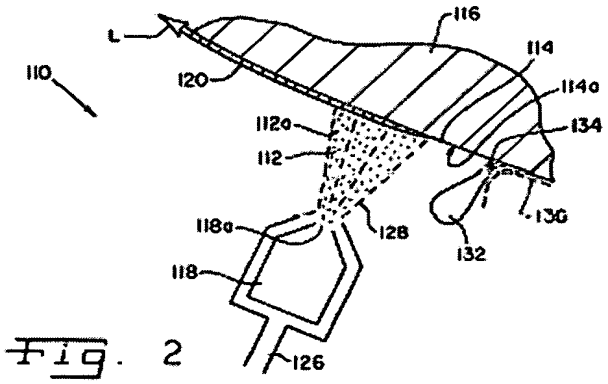


Fig. 2

If Hess' recommended steam blower were employed in Hess' **Fig. 3** embodiment, the target region would be dried or blown clean by the blower and would not have "a continuous coating of the liquid coating composition before newly applied drops land" as recited in rejected claims 33 – 35. In response to similar arguments presented previously by Appellants, the Final Rejection asserted:

> *"In response to applicant's argument that Hess prefers to use a steam blower, and this prevents the capability of having a continuous coating, it is noted that this structure is not utilized in the embodiment cited (Figure 3). This embodiment is considered capable of performing the continuous coating that is intended to be used with the claimed apparatus."* (See page 8, numbered paragraph 9).

Note first that Hess recommends using a steam blower (see e.g., col. 5, lines 33 – 45), says that air boundary layer scraping can be employed in the **Fig. 3** embodiment (see e.g., col. 6, lines 23 – 27) and says that the **Fig. 3** embodiment "will only be described in as far as it differs from the embodiment illustrated in **FIG. 2**, the description of which we otherwise expressly refer to" (col. 5, lines 58 – 61). Note next that notwithstanding the assertions in the Final Rejection, Hess' cited **Fig. 3** embodiment is not "capable of performing the continuous coating that is intended to be used with the claimed apparatus", for at least the reason that the **Fig. 3** embodiment does not have a "circulating conductive transfer surface that when wet with the liquid coating composition transfers a portion of the liquid coating composition to a substrate" as recited in rejected claims 33 – 35. Hess does not show such a device. Hess does say that it would be "feasible" to employ a "transfer roll" in his design. Hess' cited col. 6 passage is actually quite brief:

> *"Although the coating medium is applied directly to the material web in all three previously discussed design forms, it is also feasible for the coating medium to be applied to the surface of a transfer roll which then transfers the coating layer to the material web."* (col. 6, lines 43 – 47).

This brief statement does not teach the apparatus of rejected claims 33 – 35.

As an important first distinction, Hess' "transfer roll" is nowhere said to provide a "conductive" transfer surface as recited in rejected claims 33 – 35. The Final Rejection says that "Such a transfer surface would be capable of being relatively conductive if used with an electrostatic spray head", but provides no authority for this assertion and does not show where in Hess a *conductive* transfer surface may be found. The 35 U.S.C. §102 rejection should thus be reversed on at least this ground alone.

Moreover, even if Hess' transfer roll were employed, the resulting apparatus would not automatically provide a device "wherein following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region has a continuous coating of the liquid coating composition before newly applied drops land" as recited in

rejected claims 33 – 35. The Final Rejection asserted that "Such a structure would be capable of transferring as claimed", but this does not address the language of the rejected claims. For example, the Final Rejection does not show where in Hess one might find a structure that provides a target region having "a continuous coating of the liquid coating composition before newly applied drops land". Note also that the Final Rejection elsewhere acknowledges (see page 3) that "Hess is silent as to how to utilize the spray head with the transfer rollers."

Hess' silence is not a substitute for disclosure. For example, Hess does not say that his recommended steam blower system should not be employed with a transfer roll. As mentioned above, if a steam blower were employed then the target region would be dried or blown clean by the blower and would not have "a continuous coating of the liquid coating composition before newly applied drops land" as recited in rejected claims 33 – 35.

Hess also does not say whether his transfer roll should transfer all or only a portion of the coating medium to the material web. In fact Hess's statement that the transfer roll "then transfers the coating layer to the material web" (see col. 6, lines 46 – 47) implies that all the coating medium is transferred. Hess thus does not show a structure that "transfers a portion of the liquid coating composition to a substrate" as recited in rejected claims 33 – 35.

Hess also does not recommend against scraping clean the transfer roll following contact with the material web (a measure employed in the separately-cited Nakajima et al. device, discussed below). If the transfer roll is scraped clean as taught in Nakajima et al. (and if, as is elsewhere said in the Final Rejection, "one would look to Nakajima to implement the structures disclosed but not organized in Hess", see page 3) then there will not be "a continuous coating of the liquid coating composition before newly applied drops land". As noted above, the presence of a continuous coating in the target region assists newly applied drops of liquid in spreading and coalescing prior to contact with the substrate. This feature is not shown in Hess.

Thus for at least the reasons outlined above, Hess does not show an apparatus with a "conductive" transfer surface as recited in rejected claims 33 – 35, and does not show an apparatus "wherein following startup of the apparatus and one or more circulations of the

conductive transfer surface, the target region has a continuous coating of the liquid coating composition before newly applied drops land" as recited in rejected claims 33 – 35.

In response to similar arguments presented earlier by Appellants, the Final Rejection asserted:

> *"In response to applicant's argument that the startup operation and continuous use limitations differentiates from the prior art, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, I36 USPQ 458,459 (CCPA 1963)."* (See page 8, numbered paragraph 10).

Appellants are not relying on a "statement of intended use", and the rejected apparatus claims do not recite "a process of making". Appellants have merely pointed out that Hess' device does not show all the features recited in rejected claims 33 – 35, and that one skilled in the art who followed Hess' recommendations (or the recommendations of the Nakajima et al. reference relied on elsewhere in the Final Rejection "to implement the structures disclosed but not organized in Hess) would not obtain the apparatus of rejected claims 33 – 35. Appellants are thus relying on structural differences that will be observed "following startup of the apparatus and one or more circulations of the conductive transfer surface", and not on a "statement of intended use".

As a separate point, Appellants' claim 34 recites that "the substrate has a direction of motion and the transfer surface circulates in the direction of motion". Hess says nothing regarding the direction of motion of his unillustrated "transfer roll", and thus for at least this further reason does not anticipate claim 34.

It is improper to cite Hess as anticipating claims 33 – 35 based on Hess' mere statement that one element of the apparatus is "feasible", when Hess does not show an apparatus that has all the claimed features and when a person following Hess' preferences, Hess' statements and the teachings of others would not be enabled to make the claimed apparatus. Appellants thus request reversal of the 35 U.S.C. §102(e) rejection of claims 33 – 35 over Hess.

Was it proper to reject claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 under 35 U.S.C. §103(a) as being unpatentable over Hess and U.S. Patent No. 4,847,110 (Nakajima et al.)?

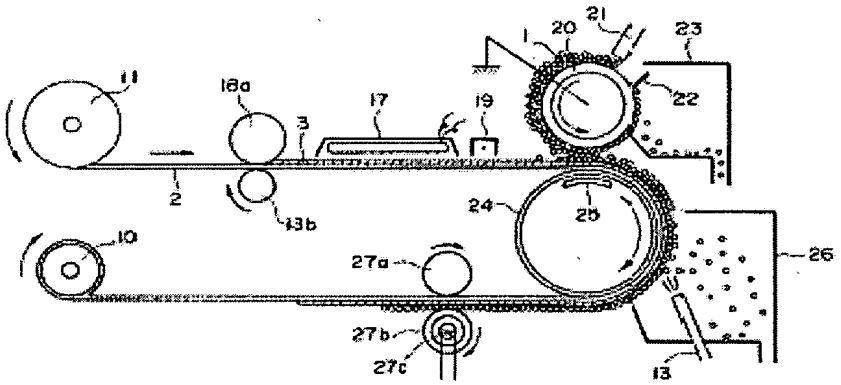
Claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 include claims from the above-mentioned Groups I, III, IV, V and VIII. Claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and U.S. Patent No. 4,847,110 (Nakajima et al.). The Final Rejection asserted, *inter alia*, that:

> *"Hess discloses an electrostatic spray head (Figure 3) that transmits a liquid coating. Hess also discloses that it is known to use transfer rollers as intermediaries in the transmission (column 6, lines 42-48). Such a transfer surface would be capable of being relatively conductive if used with an electrostatic spray head. Hess is silent as how to utilize the spray head with the transfer rollers.*
>
> *"Nakajima discloses a conductive transfer surface (item 20) which transfers a portion of the coating to a substrate (see figure 6, and structures 22 and 23), and an electrostatic spray head (item 21) that is applying the powder coating composition to the conductive transfer surface (see also column 11, lines 7-24). One in the art would appreciate that powder coatings and liquid coatings are very similar, and indeed, Hess does indicate so (column 6, lines 36-43). Thus, one would look to Nakajima to implement the structures disclosed but not organized in Hess, and Nakajima's organization allows for metering of the coating composition. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the structural organization as disclosed in Nakajima for the elements of Hess as such an organization would allow for transfer and metering of the coating spray."* (See page 3, numbered paragraph 4).

Hess and its differences with respect to claim 33 have already been discussed above. Moreover, Hess does not support the Final Rejection's assertion that "One in the art would appreciate that powder coatings and liquid coatings are very similar, and indeed, Hess does indicate so (column 6, lines 36-43)". The cited Hess passage does not say so. Hess merely says that "With the coating method and/or the applicator device of the current invention, solid, powdery coating mediums can also be converted." No proper basis has been provided for the Final Rejection's assertion concerning similarity of powder and liquid coatings. There are in fact many differences between powder and liquid coatings,

including the drop spreading and wetting characteristics discussed by Appellants at page 2, line 2 through page 3, line 13 of their Written Description.

Nakajima et al. do not cure Hess' deficiencies. Nakajima et al. describe an image forming device that applies particulate image forming elements to a moving substrate. Referring to Nakajima et al. **Fig. 6**, an electrostatic gun **21** applies image forming elements **1** to a grounded rotating transfer cylinder **20**:

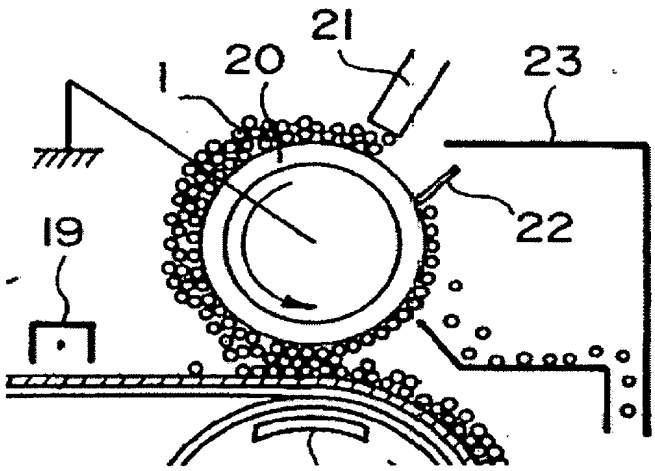


F I G. 6

The image forming elements are walled microcapsular particulates (see e.g., Fig. 1, col. 4, lines 12 – 15 and col. 7, lines 37 – 39) or solid or semisolid particulates (see e.g., col. 7, lines 39 – 45) having a range of particle sizes (see, e.g., col. 7, lines 54 – 60). Transfer cylinder **20** is scraped clean using blade **22** before being recoated. Thus clearly in Nakajima et al.'s device, there is no "liquid coating composition", no circulating conductive transfer surface "that when wet with the liquid coating composition transfers a portion of the liquid coating composition" to a substrate, no electrostatic spray head "that applies drops of the liquid coating composition" onto a target region of the conductive transfer surface, and no target region wherein following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region "has a continuous coating of the liquid coating composition before newly applied drops land".

The Final Rejection discards these differences and proposes to combine Hess and Nakajima et al. to support the rejection. However, no proper combination of Nakajima et al. and Hess would provide the claim 33 apparatus. Note particularly that transfer cylinder

20 is scraped clean by blade **22** before cylinder **20** rotates past electrostatic gun **21** and thus the target region where the applied particles land is bare:



The Final Rejection asserted:

> *"Hess and Nakajima are considered capable of operating such that following startup of the apparatus, and one or more circulations of the conductive transfer surface, the target region has a continuous coating of the liquid coating composition before new applied drops land."* (See page 4, numbered paragraph 4).

Appellants expressly disagree. No such capability is shown in Hess. Nakajima et al.'s device is as shown above clearly incapable of such operation. The Final Rejection says that "one would look to Nakajima to implement the structures disclosed but not organized in Hess". However, if Hess and Nakajima et al. were combined as proposed in the Final Rejection, the resulting device would include Nakajima et al.'s blade **22** and would not provide an apparatus whose target region has a continuous coating of a liquid coating composition before newly applied drops land. All claim limitations must be taught or suggested by the prior art, see MPEP §2143.03. A proposed combination of references cannot change the principle of operation of the prior art invention being modified, see MPEP §2143.01. The Final Rejection has not set forth a proper basis for combining Hess and Nakajima et al. and for removing Nakajima et al.'s scraper blade **22**.

In response to similar arguments submitted earlier by Appellants, the Final Rejection asserted:

> *"Furthermore, with regard to argument that Nakajima is inappropriate due to the scraper, it is noted that first, the argument depends on intended use limitations, and second, that Nakajima is not relied upon for the scraper, but rather, for the functioning of the sprayer."* (See page 8, numbered paragraph 12)

Appellants do not see how their argument concerning Nakajima et al.'s recited scraper has anything to do with "intended use limitations". Moreover, Hess already shows a sprayer and thus there would be no particular need to turn to Nakajima et al. for sprayer guidance. Nakajima et al. appear in fact to have been relied on for their transfer surface, since as acknowledged in the Final Rejection "Hess is silent as how to use the spray head with the transfer rollers" (see page 3, numbered paragraph 4). Nakajima et al.'s transfer surface includes scraper blade **22**, and no proper basis has been given for removing it. Moreover, the Final Rejection elsewhere relies on "the overall apparatus of Nakajima" (see page 6, numbered paragraph 6), and does not explain why it would be proper to rely on Nakajima et al.'s overall apparatus for some purposes but to remove a part of that apparatus (without a proper supporting reason) when making the present rejection.

Regarding claims 34 and 35 (which as noted above are in Group I), the Final Rejection asserted:

> *"As to claims 34 and 35, Hess and Nakajima discloses that the transfer surface rotates (column 11, lines 24-32), and that the surface is a cylinder (i.e., a drum or roller)."* (See page 4, numbered paragraph 4).

The apparatus of claims 34 and 35 is not suggested by the proposed combination of Hess and Nakajima et al. for at least the reasons already explained above with respect to claim 33. Moreover, as to claim 34 Hess does not disclose an apparatus "wherein the substrate has a direction of motion and the transfer surface circulates in the direction of motion".

Regarding claims 37 and 58 (which as noted above are in Group III), the Final Rejection asserted:

> *"As to claim 37, Nakajima as applied discloses that the transfer surface is grounded (column 11, lines 17-20)."*
>
> *"As to claim 58, Hess and Nakajima discloses that the conductive transfer surface is grounded and is capable of being used with coatings and substrates such that substantially none of the charges generated by the electrostatic spraying device are transferred to the substrate."*

Appellants have already pointed out above that Hess' "transfer roll" is nowhere said to provide a "conductive" transfer surface (a feature recited in rejected claims 37 and 58). Note also that Hess' "transfer roll" is nowhere said to be "grounded". Nakajima et al. do not recommend against charging their substrate, and in fact employ a corona charger **19** (along with outwardly directed air pressure at drum **20** and an adhesive receptive layer **3**) to encourage transfer of the image forming elements **1** to substrate **2** (see e.g., column 11, lines 33 – 43). Since as noted above no proper combination of Hess and Nakajima et al. suggests the claim 33 apparatus, the further features of the claim 37 or claim 58 apparatus are not suggested by these references either.

Regarding claim 38 (which as noted above is in Group IV), the Final Rejection asserted:

> *"As to claim 38, the electrostatic spray head of Hess and Nakajima is capable of producing a line of charged droplets."* (See page 4, numbered paragraph 4).

Appellants expressly disagree. The Hess and Nakajima et al. devices are shown in cross-section only. They may produce circular patterns. The Final Rejection has not provided a proper basis in Hess or Nakajima et al. for concluding that the devices of these references produce a line of charged droplets. Since as noted above no proper combination of Hess and Nakajima et al. suggests the claim 33 apparatus, the further features of the claim 38 apparatus are not suggested by these references either.

Regarding claim 43 (which as noted above is in Group V), the Final Rejection asserted:

> *"As to claim 43, the relationship of rolls 20 and 24 is functionally a nip roll since the substrate passes between these two rollers."* (See page 4, numbered paragraph 4).

Appellants expressly disagree. Rejected claim 43 recites an apparatus "further comprising one or more nip rolls that force the substrate against the conductive transfer surface". Nakajima et al.'s device does not employ and in fact deliberately avoids using a nip roll that forces the substrate against the conductive transfer surface. Nakajima et al. transfer image forming elements **1** (e.g., microencapsulated elements) into an adhesive layer **3** on substrate **2**. Excess pressure could crush the elements and render them unsuitable for their later image-forming roles. Nakajima et al. actually recommend maintaining a space of "about 0.5 – 1.5 mm" between the surface of adhesive **3** and transfer cylinder **20** (see e.g.,

col. 10, line 67 through col. 11, line 6). This space is considerably larger than the recommended image forming element diameter (see e.g., col. 4, lines 30 – 34). There is no disclosure in Nakajima et al. of "nip rolls that force the substrate against the conductive transfer surface". Appellants note in this regard that Nakajima et al. do refer to application of a pressure of "about 0.5-10 kg/cm^2" to the image forming elements **1** by the transfer cylinder **20** (see e.g., col. 11, lines 29 – 32), but this apparently refers to an outwardly-directed air pressure that pushes the image forming elements **1** away from the cylinder **20** (see e.g., col. 11, lines 17 – 19), not to a nip pressure. Since as noted above no proper combination of Hess and Nakajima et al. suggests the claim 33 apparatus, the further features of the claim 43 apparatus are not suggested by these references either.

Regarding claims 51, 52, 54, 56 and 57 (which as noted above are in Group I), the Final Rejection asserted:

> *"As to claims 51, 52, 54, 56, and 57, Hess and Nakajima's apparatus is capable of acting on the substrates claimed. As to claim 51, Hess and Nakajima can use an insulative substrate, which further as to claim 52 can be made of plastic. As to claim 54, Hess and Nakajima can be used with a porous substrate. As to claim 56, Hess and Nakajima is capable of being used with a woven or unwoven web. As to claim 57, Hess and Nakajima is capable of being used with a substrate that is an electronic film, component, or precursor thereof."* (See page 4, numbered paragraph 4).

Appellants have already pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide the claim 33 apparatus. The same arguments apply with respect to claims 51, 52, 54, 56 or 57. Moreover, "capability" is not an adequate basis for alleging obviousness. An allegation that a claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish *prima facie* obviousness, see MPEP §2143.01. For example, no proper basis has been provided for asserting that Hess or Nakajima et al. contain any suggestion of an apparatus comprising a woven or nonwoven web substrate as recited in rejected claim 56. Also, no proper basis has been provided for asserting that Hess or Nakajima et al. contain any suggestion of an apparatus comprising an electronic

film, component or electronic component precursor substrate as recited in rejected claim 57.

In response to similar arguments submitted earlier by Appellants, the Final Rejection asserted:

> *"Similarly, with regard to claims that refer to whether the liquid composition is applied to a woven or nonwoven web, or whether it substantially penetrates the web (see page 11, paper 14), these limitations are also taken to be intended use and the paragraph immediately above applies."* (See page 8, numbered paragraph 11).

Appellants expressly disagree. Claims 56 and 57 recite the substrate as a part of the apparatus. Appellants are not relying on a "statement of intended use". Neither Hess nor Nakajima et al. show or suggest an apparatus that includes the substrates recited in claims 56 or 57. For example, Appellants pointed out in their Written Description that the claim 56 apparatus can coat liquids on woven and nonwoven webs without causing the excessive penetration observed with conventional electrostatic or spray coating techniques:

> *"Through suitable adjustment of the nip pressure, penetration of the wet coating into the pores of a porous target web can be controlled and limited to the upper surface of the porous web, without penetration to the other surface of the web and preferably without penetration to the inner portion of the web. In contrast, when conventional electrostatic or other spray coating techniques are used for direct coating of a porous web, the applied atomized drops frequently penetrate into and sometimes completely through the pores of the web. This is especially true for woven webs with a large weave pattern or for nonwoven webs with a substantial void volume."* (See page 12, lines 5 – 12).

Neither Hess nor Nakajima et al. even recognize this problem, and neither shows or suggests such an apparatus. The prior art must suggest the desirability of the claimed invention, see MPEP §2143.01.

Regarding claim 55 (which as noted above is in Group VII), the Final Rejection asserted:

> *"As to claim 55, Hess and Nakajima is capable of using a liquid for coating wherein the liquid for coating does not substantially penetrate the porous substrate."* (See page 4, numbered paragraph 4).

Appellants have already pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide the claim 33 apparatus. These arguments also apply to the claim 55 apparatus. Also, Hess does not discuss the extent of substrate penetration. Nakajima et al. do not coat liquids. As noted above, "capability" is not an adequate basis for alleging obviousness and is not sufficient by itself to establish *prima facie* obviousness. No proper basis has been provided for asserting that Hess or Nakajima et al. contain any suggestion of an apparatus "further comprising the substrate, wherein the substrate is coated without substantial penetration of the coating through the substrate" as recited in rejected claim 55.

Regarding claim 59 (which as noted above is in Group VIII), the Final Rejection asserted:

> *"As to claim 59, the apparatus of Hess and Nakajima appears capable of transferring drops in the sizes claimed."* (See page 5, numbered paragraph 4).

Appellants have already pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide the claim 33 apparatus. These arguments also apply to the claim 59 apparatus. Also, Hess does not discuss transfer of "substantially void-free" coatings whose "average caliper is less than the average drop diameter" as recited in claim 59. Nakajima et al. do not coat liquids. As noted above, "capability" is not an adequate basis for alleging obviousness and is not sufficient by itself to establish *prima facie* obviousness. Appellants note in addition that application of thin void-free coatings is especially difficult. No proper basis has been provided for asserting that Hess or Nakajima et al. contain any suggestion of an apparatus "wherein the spray head produces drops having an average drop diameter, the transfer surface transfers a coating having an average caliper to the substrate, the average caliper is less than the average drop diameter, and the transferred coating is substantially void-free" as recited in rejected claim 59.

Appellants accordingly request reversal of the rejection of claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

As noted above, the claim 37 apparatus is separately patentable over claim 33 because, *inter alia*, application of the coating to a grounded conductive transfer surface prior to transfer to a substrate may facilitate coating of semi-conductive, insulative or porous substrates without requiring placement of a pre-charge or net charge on the web,

and without requiring web neutralization (see e.g., page 8, lines 1 – 7, Example 1 at page 28, lines 4 – 25; Comparison Example 4 at page 38 and Example 8 at pages 38 – 39). Similar advantages may be provided by Appellants' claim 58 apparatus. Appellants thus separately request reversal of the rejection of claims 37 and 58 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

As noted above, the claim 38 apparatus is separately patentable over claim 33 because, *inter alia*, use of a line applicator in the claimed apparatus may provide especially uniform coating of wide substrates (see e.g., Example 7 at pages 36 – 38). Appellants thus separately request reversal of the rejection of claim 38 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

As noted above, the claim 43 apparatus is separately patentable over claim 33 because, *inter alia*, a nip roll may help spread and coalesce the drops on the conductive transfer surface into a uniform, void-free coating, and decrease the time required for the drop coalescence (see e.g., page 4, lines 10 – 14, Example 2 at pages 28 – 29, and **Fig. 3a**). Appellants thus separately request reversal of the rejection of claim 43 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

As noted above, the claim 59 apparatus is separately patentable over claim 33 because, *inter alia*, it is especially difficult to prepare coatings whose average caliper is less than the average drop diameter. The claim 59 apparatus may enable preparation of such coatings (see e.g., Table IV at page 37 and the discussion at page 37, line 20 through page 38, line 2). Appellants thus separately request reversal of the rejection of claim 59 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

Was it proper to reject claims 36, 42 and 53 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claims 33 – 35 above and further in view of Booth, *Evolution of Coating*?

Claims 36, 42 and 53 are in the above-mentioned Group II, and were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claims 33 – 35 above and further in view of Booth, *Evolution of Coating*. Regarding claim 36 (which recites that the transfer surface comprises a belt), the Final Rejection asserted:

> *"As to claim 36, Nakajima does not disclose using a belt as the transfer surface. "Booth discloses using a belt and multiple transfer drums to transfer the coating liquid to the substrate (see page 37 to page 39, and Figures 40 and 41). Booth discloses that the steel belt is particularly well adapted to applying coatings to porous materials wherein a minimal "combining" pressure is needed (page 38, lines 7-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention with a desire to coat porous substrates to have added a belt for the transfer mechanism as suggested by Booth in the overall system of Nakajima in order to reduce damage to the substrate."* (See page 5, numbered paragraph 5).

Appellants have already pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide an apparatus of claim 33. These arguments also apply to the claim 36 apparatus. Booth does not overcome these arguments. The cited passage from Booth should be read in its entirety, including Booth's statements that:

> *"The coater best suited for the process was a nip fed reverse roll coater modified with a fourth roll that was rubber covered and transferred the pre-metered coating to the belt."* (See pages 37 – 38 and Figure 40).

and:

> *"Cast coating in the paper industry is now a mature process with small increases in demand. Coating has become so much more sophisticated and competitive that slow speed processes such [as] casting cannot compete for a larger market share.*

> *"Likewise, steel belt casting has high capital cost and high maintenance. With new processes such as Ultraviolet (UV) curing, the need for the special properties of belt casting are being preempted."* (See pages 38 – 39).

A person having ordinary skill in the art who reviewed Booth would not combine Hess' coater or Nakajima et al.'s coater with Booth's steel casting belt. Booth says that such a belt is best suited for use with a nip fed reverse roll coater modified with a rubber covered fourth roll. Neither Hess nor Nakajima et al. disclose a nip fed reverse roll coater, let alone one modified with a rubber covered fourth roll. Moreover, a person having ordinary skill in the art who reviewed Booth would be discouraged from using steel belt casting in any event due to steel belt casting's reported slow speed, high capital cost and high maintenance. Booth clearly teaches away from the modern-day use of steel belt casting, whether used as described by Booth or in combination with Hess' or Nakajima et al.'s coater. As is pointed out in MPEP §2143.01, "Where the teachings of two or more prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. *In re Young*, 927 F.2d 588, 18 USPQ2d 1089 (Fed. Cir. 1991)." A person having ordinary skill in the art would heed *all* of Booth's statements and would not be motivated to use Booth's steel casting belt or to combine Hess, Nakajima et al. and Booth to make the claim 36 apparatus.

Regarding claims 42 and 53 (which respectively recite "a plurality of circulating conductive transfer surfaces" and transfer of the coating "from the conductive transfer surface to a second transfer surface and thence to the substrate"), the Final Rejection asserted:

> *"As to claims 42 and 53, Booth discloses the use of multiple transfer surfaces (such as in Figures 30, 31, 32, 33 and 34, see pages 30-33) to meter the coating. Booth discloses that such multiple transfer surfaces are useful for maintaining coating weight control and uniformity (see page 30, lines 12-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to used a plurality of circulating transfer surfaces wherein the coating is transferred from a first surface to a second transfer surface as disclosed in Booth in order to maintain coating weight control and uniformity."*

Appellants have already pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus, Booth or any proper combination of Hess, Nakajima et al. and Booth would provide the claim 36 apparatus. These arguments also apply to claim 42 and claim 53. Moreover, Booth, Hess and Nakajima would not be combined as asserted in the Final Rejection. Hess focuses on applying powder coatings to paper or cardboard. Nakajima involves the application of solid or semisolid image forming element particles to a target substrate. Transfer of an applied powder, solid or semisolid coating is much more difficult than transfer of a liquid coating. For example, the Nakajima et al. **Fig. 6** apparatus employs corona charger **19**, adhesive layer **3** and outwardly directed air pressure to accomplish a single transfer of image forming elements **1** from cylinder **20** to substrate **2**. Neither Hess nor Nakajima et al. would have any motivation to add additional transfer surfaces to their respective devices. Doing so could substantially increase capital cost and decrease reliability.

Appellants accordingly request reversal of the rejection of claims 36, 42 and 53 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. in view of Booth.

Was it proper to reject claims 38 – 41 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of U.S. Patent No. 2,833,666 (Neidich)?

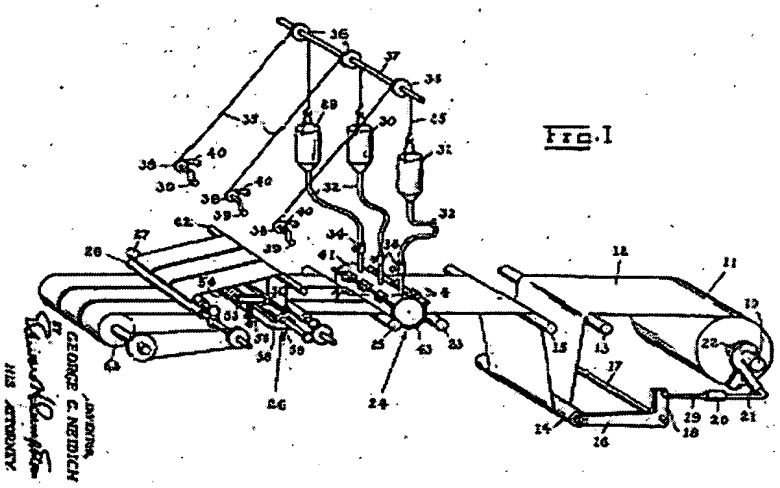
Claims 38 – 41 are in the above-mentioned Group IV, and were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of U.S. Patent No. 2,833,666 (Neidich). Regarding claim 38 (which recites an apparatus wherein the electrostatic spray head produces a line of charged droplets), the Final Rejection asserted:

> *"As to claim 38, Hess and Nakajima, while disclosing the use of a single electrostatic spray head to produce a line of charge droplets, does not disclose the alternative embodiment of a series of spray heads ganged or grouped together to apply the coating to the transfer substrate.*
>
> *"Neidich discloses using multiple applicator nozzles, which are not electrostatic spray nozzle applying to a transfer surface, but rather directly apply the coating to the moving substrate. One in the art would appreciate that the use of multiple applicator nozzles allows for the treatment of a wider substrate, thus improving the efficiency of the application operation, and would appreciate that such a multiple nozzle setup plus transfer roller as in Hess/Nakajima would allow for the coating of wider substrates. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized multiple applicator nozzles such as in Neidich in the overall apparatus of Nakajima in order to improve efficiency and improve production speed."* (See page 6, numbered paragraph 6).

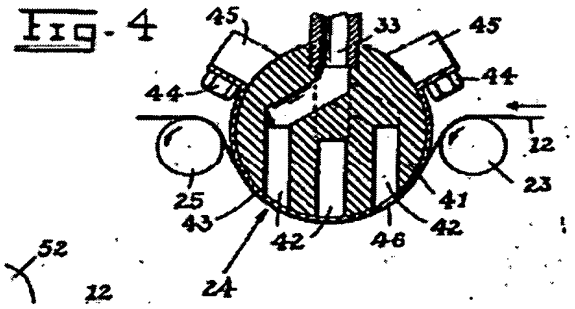
Appellants note first that neither Hess nor Nakajima et al. have been shown to disclose "the use of a single electrostatic spray head to produce a line of charge droplets". The Hess and Nakajima et al. devices are as noted above shown in cross-section only, and may produce circular patterns.

Appellants have also pointed out above why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide an apparatus of claim 33. These arguments also apply to the claim 38 apparatus. Neidich does not overcome these arguments. Neidich should be read in its entirety.

Neidich makes ink transfer ribbons, but does not employ a transfer surface or electrostatic spray nozzles to do so. Neidich's apparatus is shown in his **Fig. 1** and reproduced below:



Neidich's ink supply nozzle head **24** is shown in more detail in his **Fig. 4** and reproduced below:



Nozzle head **24** is a stationary slotted coating head for applying several liquids at once. Neidich does not involve electrostatic spray coating or application to a transfer surface. Except for the fact that all three references involve coating, no proper basis has been given for selecting Neidich from among the thousands of references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination, see MPEP §2143.01. Moreover, for the reasons already mentioned above with respect to the proposed combination of Hess and Nakajima et al., a combination of Hess, Nakajima et al. and Neidich would not provide an apparatus with a target region having a continuous coating of a liquid coating composition before newly applied drops land. All claim limitations must be taught or suggested by the prior art, see MPEP §2143.03. Moreover,

for at least the reason that none of these references discloses an electrostatic spray head that produces a line of charged droplets as recited in rejected claim 38, no proper basis has been provided for asserting that a combination of Hess, Nakajima et al. and Neidich would provide the claim 38 apparatus. The combination, if made as asserted, might instead be expected to provide an apparatus having a stationary slotted coating head for applying several liquids at once, not an apparatus having an electrostatic spray head that produces a line of charged droplets.

Appellants accordingly request reversal of the rejection of claims 38 – 41 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. in view of Neidich.

Was it proper to reject claims 44 – 50 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of U.K. Patent No. 1,278,099 (Hall)?

Claims 44 – 50 are in the above-mentioned Group VI, and were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of Hall (U.K. Patent No. 1,278,099). The Final Rejection asserted:

> *"Hess and Nakajima do not disclose multiple pick and place devices.*
>
> *"Hall discloses multiple pick and place devices, and further discloses that a minimum of five rollers, sometimes two rollers, be used per side coated (column 1, lines 41-46). Hall discloses that such devices smooth the coating, thus improving the coating. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such rollers in order to improve the coating."* (See page 7, numbered paragraph 7).

Appellants have already pointed out why none of the Hess apparatus, the Nakajima et al. apparatus or any proper combination of Hess and Nakajima et al. would provide an apparatus of claim 33. These arguments also apply to claims 44 – 50. Hall does not overcome these arguments. Hall should be read in its entirety. Appellants note first that Hall does not disclose "that a minimum of five rollers, sometimes two rollers, be used per side coated". Hall refers to the use of counter-rotating smoothing rollers for coating regenerated cellulose and other materials, and says that:

> *"It seems to be generally understood that one smoothing roller per side is insufficient, and in one difficult case it has even been proposed that a minimum of five rollers per side be employed. In general, however, two rollers per side are used."* (See page 1, lines 41 – 46).

The devices Hall refers to are not said to have rolls running at different speeds or with different diameters, and are believed to instead involve identical diameter rolls running at the same speed. If a defect passes through a relatively short train of identical diameter rolls running at the same speed, the rolls will repropagate the defect rather than reducing it

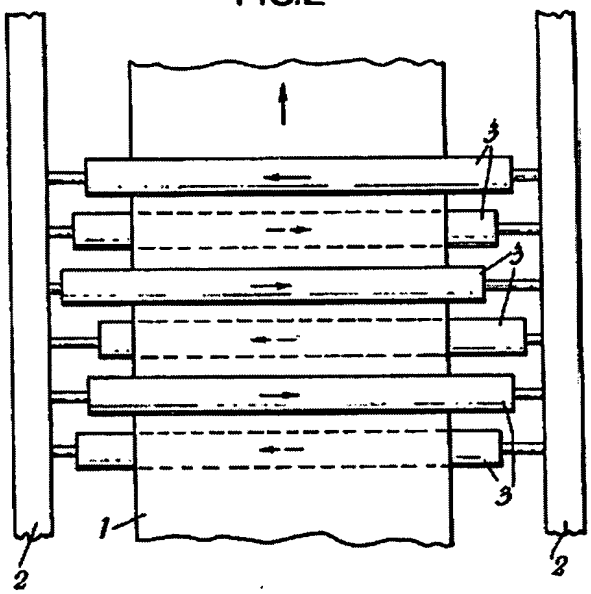
(see Appellants' Written Description at page 16, line 30 through page 18, line 19 and **Fig. 10**).

Appellants next note that in Hall's process, a coated side of a film is contacted with:

> *" at least two smoothing rollers each of which rotates in the sense such that the surface of the roller in contact with the film travels in the opposite direction to the direction of travel of the film, and at least one of which is continuously moved to and fro in relation to the film"* (page 1, lines 57 – 64)

Hall shows a device with three such rollers **3** per film side, joined together on a frame **2**:

FIG.2



These are not rolls having different diameters as recited in rejected claim 47, or undriven rolls as recited in rejected claims 48 and 49, or rolls that rotate with a belt or web as recited in rejected claim 50.

Finally, Appellants note that except for the fact that Hess, Nakajima et al. and Hall each generally involves coating, no proper basis has been given for selecting Hall from among the thousands of other references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection. If the proposed combination of Hess, Nakajima et al. and Hall was nonetheless made, the result would not provide an apparatus with a target region having a continuous coating of a liquid coating

composition before newly applied drops land as recited in rejected claims 44 – 50. All claim limitations must be taught or suggested by the prior art, see MPEP §2143.03.

Appellants accordingly request reversal of the rejection of claims 44 – 50 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. in view of Hall.

Conclusion

Hess' transfer roll is nowhere said to provide a "conductive" transfer surface. Also, Hess' transfer roll has not been shown to provide a target region having a continuous coating of a liquid coating composition before newly applied drops land. Thus for at least these reasons Hess does not anticipate the apparatus of rejected claims 33 – 35.

No proper basis has been provided for the Final Rejection's assertion concerning similarity of powder and liquid coatings. Nakajima et al.'s device does not have a "liquid coating composition", a circulating conductive transfer surface "that when wet with the liquid coating composition transfers a portion of the liquid coating composition" to a substrate, an electrostatic spray head "that applies drops of the liquid coating composition" onto a target region of the conductive transfer surface, or a target region wherein following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region "has a continuous coating of the liquid coating composition before newly applied drops land". Even if Hess and Nakajima et al. were combined as proposed in the Final Rejection, the resulting device would include Nakajima et al.'s blade **22** and would at the very least not provide an apparatus whose target region has a continuous coating of a liquid coating composition before newly applied drops land. Thus for at least these reasons Hess and Nakajima et al. do not make obvious the apparatus of rejected claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59.

A person having ordinary skill in the art who reviewed Booth would not combine Hess' coater or Nakajima et al.'s coater with Booth's steel casting belt. Booth says that such a belt is best suited for use with a nip fed reverse roll coater modified with a rubber covered fourth roll. Neither Hess nor Nakajima et al. disclose a nip fed reverse roll coater, let alone one modified with a rubber covered fourth roll. Moreover, a person having ordinary skill in the art who reviewed Booth would be discouraged from using steel belt casting in any event due to steel belt casting's reported slow speed, high capital cost and high maintenance. Thus for at least these reasons Hess, Nakajima et al. and Booth do not make obvious the apparatus of rejected claims 36, 42 and 53.

No proper basis has been given for selecting Neidich from among the thousands of references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection. None of these three references discloses an electrostatic spray head that produces a line of charged droplets. Also, no proper basis has

been provided for asserting that a combination of Hess, Nakajima et al. and Neidich would provide an apparatus of claims 38 – 41. The combination, if made as asserted, might instead be expected to provide an apparatus having a stationary slotted coating head for applying several liquids at once, not an apparatus having an electrostatic spray head that produces a line of charged droplets. Thus for at least these reasons Hess, Nakajima et al. and Neidich do not make obvious the apparatus of rejected claims 38 – 41.

No proper basis has been given for selecting Hall from among the thousands of other references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection. If the proposed combination of Hess, Nakajima et al. and Hall was nonetheless made, the result would not provide an apparatus with a target region having a continuous coating of a liquid coating composition before newly applied drops land, and would not provide an apparatus with rolls having different diameters, undriven rolls or rolls that rotate with a belt or web. Thus for at least these reasons Hess, Nakajima et al. and Hall do not make obvious the apparatus of rejected claims 44 – 50.

Following startup of Appellants' claimed apparatus and one or more circulations of the conductive transfer surface, drops of an applied liquid coating composition land on a target region that already has a continuous coating of the liquid coating composition. This greatly facilitates wetting and spreading of the newly applied drops, and facilitates the formation of coatings having fewer voids and improved uniformity. These advantages would not be recognized from the cited references, whether taken alone or in any proper combination.

Appellants accordingly request that the 35 U.S.C. §102(e) rejection and all four 35 U.S.C. §103(a) rejections be reversed.

Respectfully submitted on behalf of 3M Innovative Properties Company

April 19, 2004

David R. Cleveland
Registration No: 29,524
612-331-7412 (telephone)
612-331-7401 (facsimile)

IPLM Group, P.A.
P.O. Box 18455
Minneapolis, MN 55418

All correspondence regarding this application should be directed to:

Brian E. Szymanski
Office of Intellectual Property Counsel
3M Innovative Properties Company
P.O. Box 33427
St. Paul, Minnesota 55133-3427
Telephone: (651) 737-9138
Facsimile: (651) 736-3833

CLAIMS ON APPEAL

33. (Amended) An apparatus comprising a liquid coating composition, a circulating conductive transfer surface that when wet with the liquid coating composition transfers a portion of the liquid coating composition to a substrate, and an electrostatic spray head that applies drops of the liquid coating composition onto a target region of the conductive transfer surface, wherein following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region has a continuous coating of the liquid coating composition before newly applied drops land.

34. (Amended) An apparatus according to claim 33 wherein the substrate has a direction of motion and the transfer surface circulates in the direction of motion.

35. (Original) An apparatus according to claim 34 wherein the transfer surface comprises a drum.

36. (Original) An apparatus according to claim 34 wherein the transfer surface comprises a belt.

37. (Original) An apparatus according to claim 33 wherein the transfer surface is grounded.

38. (Amended) An apparatus according to claim 33 wherein the electrostatic spray head produces a line of charged droplets.

39. (Amended) An apparatus according to claim 33 wherein the electrostatic spray head comprises a plurality of electrostatic spray heads that apply one or more coating compositions to the conductive transfer surface in one or more lanes.

40. (Amended) An apparatus according to claim 39 wherein the plurality of spray heads applies a plurality of coating compositions to one lane.

41. (Amended) An apparatus according to claim 39 wherein the plurality of spray heads applies coating compositions to a plurality of lanes.

42. (Original) An apparatus according to claim 33 comprising a plurality of circulating conductive transfer surfaces.

43. (Original) An apparatus according to claim 33 further comprising one or more nip rolls that force the substrate against the conductive transfer surface.

44. (Amended) An apparatus according to claim 33 further comprising two or more pick-and-place devices that can periodically contact and re-contact the wet coating at different positions on the substrate, wherein the devices have periods that improve the uniformity of a coating on the substrate compared to a coating made without such devices.

45. (Original) An apparatus according to claim 44 wherein at least one of the pick-and-place devices comprises a roll.

46. (Original) An apparatus according to claim 45 comprising three or more pick-and-place rolls.

47. (Original) An apparatus according to claim 46 wherein three or more of the rolls have different diameters.

48. (Original) An apparatus according to claim 46 wherein at least one of the rolls is undriven.

49. (Original) An apparatus according to claim 46 wherein all of the rolls are undriven.

50. (Amended) An apparatus according to claim 46 further comprising the substrate, wherein the substrate comprises a rotating endless belt or moving web, and the rolls rotate with the belt or web.

51. (Amended) An apparatus according to claim 33 further comprising the substrate, wherein the substrate comprises an insulative substrate.

52. (Amended) An apparatus according to claim 51 further comprising the substrate, wherein the substrate comprises plastic.

53. (Original) An apparatus according to claim 33 wherein the coating is transferred from the conductive transfer surface to a second transfer surface and thence to the substrate.

54. (Amended) An apparatus according to claim 33 further comprising the substrate, wherein the substrate comprises a porous substrate.

55. (Amended) An apparatus according to claim 54 further comprising the substrate, wherein the substrate is coated without substantial penetration of the coating through the substrate.

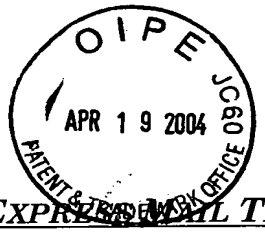
56. (Amended) An apparatus according to claim 33 further comprising the substrate, wherein the substrate comprises a woven or nonwoven web.

57. (Amended) An apparatus according to claim 33 further comprising the substrate, wherein the substrate comprises an electronic film, component or electronic component precursor.

58. (Original) An apparatus according to claim 33 wherein the conductive transfer surface is grounded and substantially none of the charges generated by the electrostatic spraying device are transferred to the substrate.

59. (Original) An apparatus according to claim 33 wherein the spray head produces drops having an average drop diameter, the transfer surface transfers a coating having an average caliper to the substrate, the average caliper is less than the average drop diameter, and the transferred coating is substantially void-free.

IPLM Group, P.A.
P.O. Box 18455
Minneapolis, MN 55418
612-331-7400 telephone
612-331-7401 facsimile



04-20-04 IFW AF/1734

PATENT

Attorney Docket No.	Serial No.
56433US002	09/841,380

EXPRESS MAIL TRANSMITTAL LETTER

MS: Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In re Application of:	Albert E. Seaver and William K. Leonard		
Serial No.:	09/841,380	Examiner:	George R. Koch
Confirmation No.:	5859	Art Unit:	1734
Filed:	April 24, 2001		
For:	ELECTROSTATIC SPRAY COATING APPARATUS AND METHOD		

We are transmitting the following documents:
Return Postcard
Express Mail Transmittal Letter [1 page]
Fee Transmittal for FY 2004 [1 page]
Brief On Appeal [42 pages] in triplicate

Please charge Deposit Account 13-3723 for any fees under 37 CFR §1.16 and §1.17 that may be required during the pendency of this application. This authorization includes the fee for any extension of time under 37 CFR §1.136(a) that may be necessary. To the extent any such extension should become necessary it is hereby requested.

Respectfully submitted,

Registration No.	Direct Dial	
29,524	612-331-7412	
Date: April 19, 2004		David R. Cleveland

Certificate of Express Mail

Pursuant to 37 CFR 1.10, I certify that three copies of this Brief on Appeal are being deposited on the date indicated below with the United States Postal Service "Express Mail Post Office to Addressee" service addressed to: MS: Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Express Mail No.: ER 523730443 US	Lynelle K. Grube
Date of Mailing: April 19, 2004	